highly organised animals, indeed I am not aware of any similar instance among birds.

Besides the birds above-mentioned, the Gardens contain the only examples ever received in Europe of the *Kaka* Parrot (*Nestor hypopolius*), another form of bird-life restricted to the forests of New Zealand.

I must now say a few words about the Reptilian life of New Zealand. As regards this branch of the animal kingdom, the Zoological Society's Gardens cannot be said to be very well supplied; at the same time we have now in them a living example of what is certainly the rarest and most singular species of the reptilian class that inhabits these islands. This is the Tuatera Lizard (*Sphenodon punctatum*), of which I have already given a notice in a former article in this journal.* Dr. Günther will, I hope, forgive me for calling it a lizard, for in spite of his elaborate proof that it is utterly different from every other known form of the Lacertian order, I cannot quite agree with him that it is entitled to form an order of itself.

As regards the general character of the reptilian fauna of New Zealand, after mentioning the Tuatera, there is not much to be said. There are, I believe, no representatives of the orders of Tortoises, Crocodilians, or Ophidians to be met with in these islands. Besides the *Sphenodon*, the only other reptiles indigenous to New Zealand are about half-a-dozen small lizards belonging to the families *Scincidæ* and *Geccotidæ*. Some of these are of Australian character, the remainder are peculiar to New Zealand.

Of the class of Batrachians, only one member is known to exist in New Zealand—a frog (*Leiopelma hochstetteri*), not found elsewhere.

Fresh-water Fishes, which must also be taken into account when estimating the peculiarities of a land-fauna, are likewise not very abundant in New Zealand. Two forms, however, deserve special notice, as indicating a former land connection at however remote an epoch, between Australia and South America passing through these islands. These are *Protrotoctes*,† belonging to a group representative of the Salmonoids of the northern hemisphere, and *Galaxias*, belonging to a family allied to the Pikes (Esocidæ) which is likewise found in the rivers of Australia and Antarctic America. Nearly allied to *Galaxias* is a very curious form, recently described by Dr. Günther under the name *Neochanna apoda*,‡ but remarkable for the absence of ventral fins, and its mud-loving habits. This fish is restricted to New Zealand.

The peculiarities of the fauna of New Zealand, so far as is shown by its terrestrial vertebrated animals, may therefore be summed up somewhat as follows:—

1. The absence of all Mammals, except two species of Bats.

2. The presence of numerous forms of Bird-life not known elsewhere, such as *Heteralocha*, *Nestor*, *Strigops*, *Apteryx*, and *Anarhynchus*.

3. The absence of Reptiles, except two genera of lizards and the *Sphenodon punctatum*, which, according to some of the best authorities, has claims to constitute an order of reptiles *per se*.

4. The absence of Batrachians, except one species of frog not known elsewhere.

5. The paucity of fresh-water Fishes—few genera only being known—which are allied partly to Australian and partly to Antarctic American forms.

But before closing our summary, it must not be forgotten to be mentioned that almost within the historical period New Zealand was tenanted by upwards of a dozen species of Struthious birds, constituting a family *per se*, but allied to the Cassowaries and Emus of Australia and the Papuan Islands. We must therefore add as a sixth item:

6. The recent presence of a peculiar family of gigantic Struthious Birds, now extinct—the Dinornithidæ—restricted to New Zealand.

P. L. SCLATER

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* See NATURE, vol. ii. p. 148

† Cf. Günther, Proc. Zool. Soc., 1870, p. 152.

‡ See Ann. Nat. Hist. ser. 3, vol. xx. p. 305.

NOTES

IN other columns will be found the reports which have reached us up to the present time from the different sections of the Eclipse Expedition. Notwithstanding the unpropitious weather at nearly all the stations, we trust that some observations have been made which will throw light on still unsolved problems of Solar Physics. It is with great satisfaction that all English astronomers will hear that M. Janssen performed his perilous balloon voyage in safety, and reached his destination in Algeria; although he does not appear to have been rewarded with the opportunity of taking any satisfactory observations.

THE *Journal of Botany* states that the post of Curator of the Botanic Gardens, Calcutta, vacated by the death of Dr. Anderson, has been given to Dr. King, who has done some work in Indian botany, but is comparatively unknown in English botanical circles. This is the best-paid botanical appointment in England or any of its dependencies.

THE following are announced as the probable arrangements for the Friday evening meetings at the Royal Institution before Easter, 1871, to which members and their friends only are admitted:—Friday, January 20th, Professor Tyndall, LL.D. F.R.S.; Friday, January 27th, Professor Odling, F.R.S.; Friday, February 3rd, W. Spottiswoode, Treasurer R. S.—Some experiments on Successive Polarization of Light made by Sir C. Wheatstone; Friday, February 10th, E. J. Reed, C.B.—On Some Fallacies connected with Ships and Guns; Friday, February 17th, James N. Douglas, Engineer to the Trinity House—On the Wolf-Rock Lighthouse; Friday, February 24th, Dr. W. B. Carpenter, F.R.S. &c.—The latest Scientific Researches in the Mediterranean and Straits of Gibraltar; Friday, March 3rd, Capt. Noble, F.R.S.—On the Pressure of Fired Gunpowder; Friday, March 10th, W. Mattieu Williams—On Rumford's Scientific Discoveries; Friday, March 17th, J. Norman Lockyer, Esq., F.R.S.—On the Eclipse; Friday, March 24th, Professor J. Clerk Maxwell, M.A., F.R.S.—On Colour; Friday, March 31st, Professor Max Müller, LL.D.—On Solar Myths.

THE following gentlemen have obtained a first class in Natural Science at Oxford at the last examination:—C. Childs, Scholar of Merton, F. H. Champneys, Brazenose, F. W. Fison, Scholar of Christ Church, S. J. Sharkey, Scholar of Jesus.

THE Natural Science Scholarship at Merton College, Oxford, has been awarded to Mr. Richmond of the Manchester Grammar School, and an Exhibition to Mr. Ferguson of the same school.

PROF. AGASSIZ announces that the Museum of Comparative Zoology at Harvard College, Cambridge, U.S., is prepared to furnish extensive collections of all the rocks and loose deposits found upon and about the Key and reefs of Florida; also complete collections of the Corals in fresh and well-preserved specimens, in exchange for recent and fossil corals from other parts of the world.

THE *Pall Mall Gazette* states that a committee has been appointed, with Captain Beaumont, R.E., M.P., as president, and Lieutenant Grove, R.E., and Mr. Abel, F.R.S., as members, to carry out experiments on the utilisation of balloons for reconnoitring purposes. The former experiments on this subject, which were carried out at Woolwich and elsewhere a few years ago, were not attended with any useful results, and we believe the attempts which have been made during the present war to reconnoitre with balloons—an application not to be confused with the use of balloons for postal purposes—have not been more satisfactory. But the Americans on several occasions employed balloons to reconnoitre with fair success, and Captain Beaumont's committee may be able to throw some new light upon a subject which it certainly seems worth while to work out.

THE frost which has now lasted for a fortnight is the most severe that has been known in England since the memorable one of Christmas, 1860, that is, for exactly ten years. The lowest temperature at Blackheath was 15·3° F. on the night of the 24th December; but in the eastern counties the cold was more intense, being 8° at Hull, and nearly as low at Norwich, Nottingham, and Leicester. The highest minimum recorded by Mr. Glaisher in the *Gardener's Chronicle*, at any English station is 19·0°, at Leeds. In Scotland the minimum varied between 5·0° at Perth, and 19·2° at Aberdeen. The average was slightly higher in Scotland than in England. For the first fourteen days of the frost, the temperature scarcely rose above the freezing-point night or day, a very unusual circumstance in this country.

A SOCIETY has just been instituted under the designation of *The Society of British Archæology.* It originated in a meeting held on Dec. 9th in the rooms of the Royal Society of Literature, the proposed objects being "the investigation of the Arts, Archæology, History, and Chronology of Ancient and Modern Assyria, Palestine, Egypt, Arabia, and other Biblical Lands, the promotion of the study of the antiquities of those countries, and the preservation of a continuous record of discoveries now or hereafter to be in progress." Dr. Birch, of the British Museum, who occupied the chair on that occasion, explained that the proposed society would clash with none of the philological or exploration associations now in existence, but would have a distinct purpose—to concentrate and utilise the scattered materials connected with the geography, arts, and antiquities of the lands of the Bible, and to systematise the progress of Archæological research in England, America, and the Continent. The Society has already received the promise of the support of the most eminent living Biblical investigators, and another meeting will shortly be summoned for its complete establishment.

UNDER the title of "Science Education Abroad," Principal Dawson of M'Gill University, Montreal, republishes his Annual University Lecture, of the session 1870-71. After reviewing the state of scientific education in foreign countries from a Canadian point of view, as exhibited by the present condition of the various institutions for the spread of Science in Great Britain, the United States, Germany, and Switzerland, he contrasts with this the want of Science teaching in Canada. With the exception of two or three small and poorly supported agricultural schools, he states that the Dominion does not possess a school of practical Science, notwithstanding its mining resources, second to those of no country in the world. In the M'Gill University itself some part of Natural or Physical Science is studied in each year of the College course; but this falls far short of providing the full measure of the higher Science education required for the development of the resources of the country.

PROFESSOR M'NAB has been pursuing his investigations on the Transpiration of Watery Fluid by Leaves, to which reference was made a short time since in our columns.* The plant used in all the experiments was the common laurel (*Prunus laurocerasus*), and the fluid to test the rapidity of the ascent lithium citrate. The following are some of the more important results arrived at:—The total quantity of water in the leaves was found to be 63·4 per cent.; but of this, the proportion which could be received by calcium chloride, sulphuric acid, or by the action of the sun, was only from 5 to 6 per cent.; hence Dr. M'Nab calculates the amount of transpirable fluid in the stem and leaves to be between 6 and 7, the amount of fluid in relation to cell-sap to be between 56 and 57 per cent. The rapidity of transpiration he found to be in sunlight 3·03 per cent. in an hour; while in diffused daylight it was only ·59, and in darkness ·45 per cent. in the same time. These experiments were made when the plant had access to water by means of its stem. When the leaves were exposed without any means of supplying themselves again, the following results were obtained:—In a saturated atmosphere in the sun, 25·96 per cent. was transpired in an hour, in a dry atmosphere in the sun 20·52 per cent. In the shade, the numbers were reversed—viz., in a saturated atmosphere nothing, in a dry atmosphere 1·69 per cent. When immersed in water, the leaves absorbed 4·57 per cent. of their weight in seventeen hours, in a saturated atmosphere nothing whatever in eighteen hours. The under surface of the leaf transpired nearly ten times as much as the upper surface.

WE are very glad to see that the second series of penny science-lectures delivered in November in the Hulme Town Hall have been reprinted. They embrace:—Coral and Coral-reefs, by Prof. Huxley; Spectrum Analysis, by Prof. Roscoe; Spectrum Analysis in its relation to the Heavenly Bodies, by Dr. Huggins; and On Coal, by Mr. Boyd Dawkins. The reports have all been revised by the respective lecturers; and being published at one penny each, ought to have a very large sale. We cannot conceive a greater aid to scientific teaching than the circulation of these lectures; both for the information they contain, and as models to lecturers of what scientific lectures to working men should be.

THE last number of the *Bulletin de la Société Royale de Botanique Belgique* contains an interesting paper by M. Devos on the plants naturalised in, or introduced to, Belgium. Of the 1,566 phanerogams recorded for that country, no less than 512 are supposed to have been introduced. Of these 91 are from southern Europe, 137 from the east, 14 from central, and 5 from north Europe; "alpine regions" have furnished 16, 34 are from America, and 5 from Africa; while the native countries of the remaining 210 are unknown. The distribution of each species is traced out with reference to its occurrence in other countries under similar circumstances; and the paper is a valuable contribution to phytogeographical science.

AMONG the curiosities of scientific literature a little work, published a few years since, must find a place. It is entitled "Principles and Rudiments of Botany, delivered according to an Iulian system of arrangement and Iulian method of classification; by C. R. W. Watkins, Gent., late Captain in the Bombay Army." These "principles and rudiments" are here, according to the preface, delivered in language "better adapted for the intellectual amusement and instruction of young persons of both sexes" than that employed in previous works; and "Botanical science" is "rendered more agreeable to students in modern times." The following extract will give a faint idea of the mode in which these promises are fulfilled, and also of the contents of the volume:—"The pink (*Dianthus*) has four or five idola; ten to twenty ikona. and twenty to forty petala. The flowers are few, and di, tri, quinque ligate, and they terminate separately and irregularly. The Sweet William (*Dirythme*) has two idola, ten ikona, and five petala. The flowers are numerous and chorovinkulate, and the mode of gemmation comprises several synterminal and equimarginal chorrythma, or conturrythma. They cannot, therefore, be of the same genus; because the numerical indices, and typical characters of each gemmos, or hermaphral gemm bud of the two kinds of plants, are not symbolical; but differ, as well as the mode of gemmation, more widely than the specific, and physical circumstances of their constitutional, or peculiar veget-organical structure."

THE laws which formerly existed in Scotland, and are still enforced in Denmark, to compel the extirpation of the Corn Marigold (*Chrysanthemum segetum*), have their parallel in New Zealand, in some parts of which it is a punishable offence to allow the growth of thistles. In the colony of Lyttelton proceedings were taken, during the present year, against a gentleman for having neglected to eradicate certain thistles, after having been requested to do so. The defendant alleged that men had been employed for ten days in striving to exterminate them, and that ten donkeys were kept for the sole purpose of eating off the tops of the thistles. The Bench, however, were of opinion that no adequate steps had been taken since a previous conviction, and imposed a fine of 5*s.* per day from that date.

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* See NATURE, vol. ii. p. 515.

We learn from Dr. Müller's last report of the Melbourne Botanic Gardens that the noxious "Cape Weed" (*Cryptostemma calendulaceum*), is becoming suppressed in his vicinity by the gradually denser growth of lucerne, clover, and grass. The plant was noticed as an inexterminable weed of Australia, by Baron von Huegel, in 1833. It would appear that more than one plant is known as "Cape Weed," as another Composite (*Hypochœris radicata*), is so called in New Zealand, where, in the neighbourhood of Dunedin, it is spreading to a serious extent.

A writer in the *Field* for Dec. 17, advocates the cultivation of *Symphytum asperrimum* as food for cattle. He recommends that the plants should be set about two feet six inches from each other; and that the most forward of the leaves should be plucked as they develop. Horses are very fond of it, and it is beneficial in its effects upon them. It is not recommended that it should be made store of, but the leaves should be gathered and eaten fresh. It will be remembered that Prof. Buckman, when at Cirencester, instituted some experiments upon this plant, which led him to the conclusion that it was not specifically distinct from the common Comfrey (*S. officinale*); and it is therefore probable that the latter would be equally suitable for cattle. *S. asperrimum* is a plant of very rapid growth; boiled as a vegetable it is palatable, and in Germany it is a favourite ingredient in salad.

Among the various notes upon tree-worship which have lately appeared, no mention has been made of the Cotton-tree (*Eriodendron anfractuosum*). Of this Dr. Macfadyen, in his "Flora of Jamaica," writes as follows: "Perhaps no tree in the world has a more lofty and imposing appearance, whether overtopping its humbler companions in some woody district, or rising in solitary grandeur in some open plain. Even the untutored children of Africa are so struck with the majesty of its appearance, that they designate it the God-tree, and account it sacrilege to injure it with the axe; so that, not unfrequently, not even the fear of punishment will induce them to cut it down. Even in a state of decay it is an object of their superstitious fears; they regard it as consecrated to evil spirits, whose favour they seek to conciliate by offerings placed at its base."

An early mention of tobacco is that in Hakluyt's "Voyages," by M. Jaques Carthier, in 1534. Speaking of the people of "Hochelaga, up the river of Canada," he says, "There groweth also a certain kind of herbe, whereof in Sommer they make great prouision for all the yeere, making great account of it, and onely men vse of it, and first they cause it to be dried in the Sunne, then weare it about their neckes wrapped in a little beasts skinne made like a little bagge, with a hollow peece of stone or wood like a pipe, then when they please they make pouder of it, and then put it in one of the ends of the said Cornet or pipe, and laying a cole of fire upon it, at the other ende sucke so long, that they fill their bodies full of smoke, till that it commeth out of their mouth and nostrils, even as out of the Tonnell of a chimney. They say that this doth keepe them warme and in health, they neuer goe without some of it about them. We ourselves haue tryed the same smoke, and hauing put it in our mouthes, it seemed almost as hot as Pepper."

As a general rule, plants which are casually introduced to, and become firmly established in, any country, are by no means to be regarded as useful acquisitions; some of the worst weeds of cultivation may be found among them. An exception to this, however, may be noticed in *Lespedeza striata*, "Japan clover," or "wild clover," as it is called in the localities to which it has introduced itself. It has recently sprung up in great abundance in all parts of the Southern States, and has proved a great acquisition to the farmers. The roots, which are long and fibrous, penetrate and flourish even in sandy roads and in yards; and a single root will send out as many as six hundred branches. The *Lespedeza* is a close-growing plant, covering the ground as with a carpet of green, and is taking the place of the sedges and other weeds upon the waste lands and clearings. Cattle, horses, and sheep eat it greedily; and it is in every way an important addition to the fodder-plants of the country.

A contradiction is given to the reported discovery of coal in the Bellary district in Madras.

On the 3rd of October the Faculty of Science and Polytechnic School were opened at Quito in Ecuador. There is reason to believe that these establishments of the repudiatory republic are more pretentious than real.

Cinchona has so fully succeeded in the Neilgherry Hills in India that the first shipment of bark from a private plantation to the extent of 4,000 lbs. is taking place. The Government promoted Cinchona plantations chiefly for the supply of India, but they are already engaging in the home trade.

A rare discovery has been made near the port of Mejillones in that district of the rainless desert of Atacama belonging to Bolivia, of a spring of fresh water. This has been granted to the discoverer for ten years, and then to become the property of the State.

On the 18th of October, at 5 P.M., a slight earthquake was felt at Salvador in Central America. There had been heavy rains for some days.

The Queensland Acclimatisation Society, under the patronage and with the assistance of his Excellency the Governor and other influential persons in the colony, appears to be in a satisfactory condition, both financially and with regard to the work done, as well as the earnestness and ability of its workers. In the park belonging to the society a considerable number of foreign trees have been introduced, and amongst them the splendid tree of Madagascar (*Poinciani regia*), which, we are told, is being raised by hundreds. This success of foreign trees is very gratifying at a time when the question of want of shade trees is a matter of much interest, not only in Queensland, but also in other colonies. The Shola (*Æschynomene aspera*) is likewise amongst the recently-introduced plants which promise success. It is a native of India, and is well known on account of its light wood being used for making the "pitte" hats, so much used in tropical countries. Among British birds introduced by the Society, and which survived the voyage from London, the blackbird, thrush, starling, rook, sparrow, and lark, have been liberated in the Botanic Garden; but at the time the report was drawn up little could be said as to their condition or whereabouts, except that one pair of sparrows were then rearing their second brood in the heart of the city. Large numbers, also, of Chinchilla rabbits, and of the wild English breed, have been turned loose on the islands of Moreton Bay, but care has been taken to keep the different kinds separate.

It is not a little remarkable that *Corchorus capsularis*, one of the plants yielding the jute of commerce now so largely imported and used in the manufacture of carpets, and also largely used in India for gunny bags, should, though growing wild in Sumatra, not be cultivated in that island. The bags in which Java coffee is exported are made of this fibre. Large quantities of these ready-made bags are annually sent from Bengal, even to Java.